

CREEDIA ALLENI AND *CREEDIA PARTIMSQUAMIGERA*
(PERCIFORMES: CREEDIIDAE), TWO NEW MARINE
FISH SPECIES FROM AUSTRALIA, WITH
NOTES ON OTHER AUSTRALIAN
CREEDIIDS

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Abstract.—Two new species of trachinoid fishes, *Creedia alleni* and *C. partimsquamigera*, are described. *Creedia alleni*, known from three specimens collected along coastal Western Australia, is distinguished from all other creediids in having only three soft rays, in addition to a spine, in each pelvic fin. *Creedia partimsquamigera*, known from nine specimens from New South Wales, is similar to *C. haswelli* (Ramsay) in fin ray counts but differs in lacking scales on the anterior portion of the body except along the lateral line and before the dorsal fin, and differs further from the other two species of *Creedia* in having a blunter snout and a blunt maxilla extending well behind the eye. *Creedia partimsquamigera* and *C. haswelli* exhibit sexual dimorphism, with males having longer pectoral and pelvic fins than females. Notes are given on the three other creediids from Australia, namely, *C. haswelli*, *Limnichthys fasciatus* Waite, and *L. donaldsoni* Schultz (newly found in Australia).

The family Creediidae (including Limnichthyidae) currently contains 12 described species in seven genera (Nelson 1979). Herein I describe two new species, one from near Perth, Western Australia, and the other from Sydney, New South Wales. New material of *Limnichthys fasciatus* from Western Australia and of *L. donaldsoni* and *Creedia haswelli* from eastern Australia is reported.

Methods

Measurements were made to the nearest 0.1 mm with needle-point dial calipers and are expressed as thousandths (‰) of standard length (SL). Radiographs were made of the specimens of the two new species. Abbreviations refer to the following museums: AMNH, American Museum of Natural History, New York; AMS, Australian Museum, Sydney; NMV, National Museum of Victoria, Melbourne; QVM, Queen Victoria Museum, Launceston; TFDA, Tasmanian Fisheries Development Authority, Hobart; UAMZ, University of Alberta Museum of Zoology, Edmonton; UCLA, Department of Zoology, University of California, Los Angeles; WAM, Western Australian Museum, Perth.

Creedia alleni, new species

Fig. 1

Holotype.—WAM P25808-005, 40.0 mm SL, probably a female, off Garden Island, near Fremantle, Western Australia, 32°15.7'S, 115°39'E, collected with beam trawl in 20 m, 29 June 1977. Bottom: sand and weed.

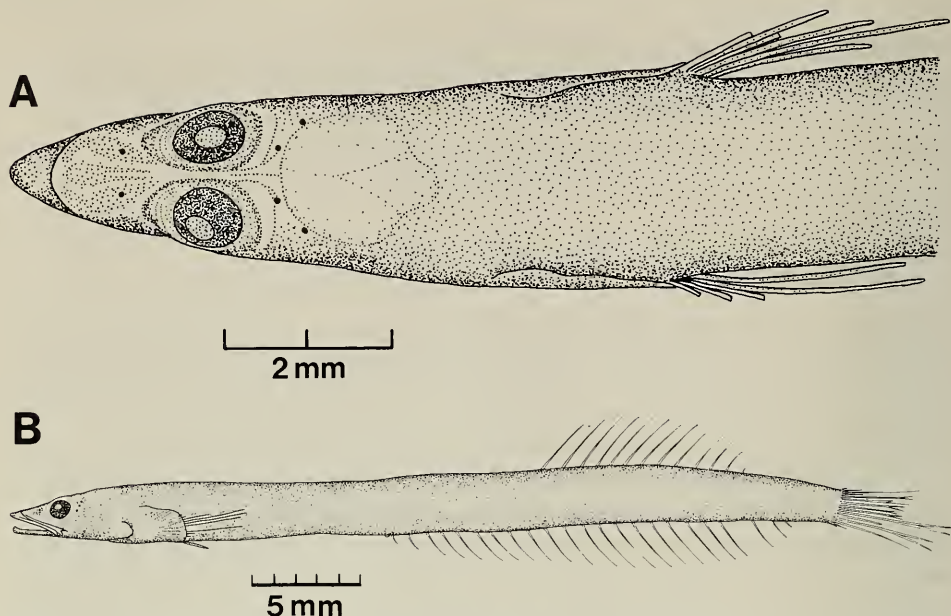


Fig. 1. *Creedia alleni*, holotype, WAM P25808-005, 40 mm SL. A, Dorsal view of head region; B, Lateral view.

Paratypes.—WAM P25346-028, 34.5 mm SL, off Gage Roads, Carnac Island, between Rottnest Island and Fremantle, Western Australia, 32°02'S, 115°40'E, collected with dredge, 30 June 1975, subsequently stained; WAM P25347-001, 28.2 mm SL, same locality, 24 July 1975.

Diagnosis.—A creediid with a 1,3 pelvic fin (Fig. 2). All other creediids have the pelvic fins absent or 1,4–5 (most 1,5). Differs further from *C. haswelli* in having, on average, slightly fewer dorsal-fin rays (12 or 13 vs. 13–16), anal-fin rays (24 vs. 24 or more and usually 25 or 26), and vertebrae (41 or 42 vs. 42–45, usually 43 or 44). The two tear-shaped epurals (observable in stained specimen only), may be unique in creediids (the epurals are relatively narrow in all other species with two).

Description.—Morphometric and meristic data are given in Table 1. Snout relatively elongate, sloping gradually in dorsal profile. Upper jaw with fleshy extension anterior to lower jaw; maxilla extending posteriorly to, or slightly beyond vertical at center of eye; posterior tip of maxilla with well-developed notch (fork), lower lobe of fork longer than upper, upper lobe hidden under sheath when mouth closed. Bony dorsal projection at symphysis of lower jaw (Fig. 3). Lower jaw bordered by one row of pointed cirri of relatively uniform length (about 17 per side in the holotype, 16 in larger paratype, and 11 in smaller paratype). Eyes dorsal; interorbital distance small (fleshy width about 5% SL and bony width about half that); small, fleshy sheath covers lowermost part of eye. Tongue long and slender with slightly expanded, blunt, anterior tip. Ventral opercular flap extends far forward, overlapping branchiostegal membrane; posterior portion of gill cover overlaps base of pectoral fin. Branchiostegal rays seven (only six definitely seen in holotype). Bone of gill cover splintered (clearly visible in unstained

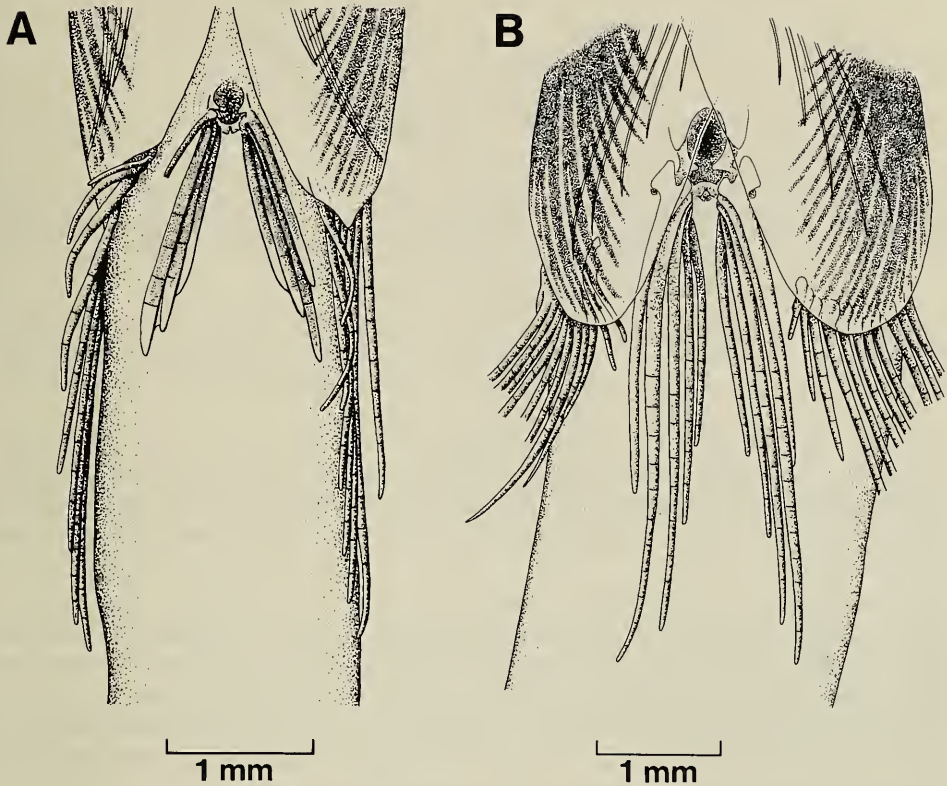


Fig. 2. Pelvic fin region of *Creedia*. A, *Creedia allenii*, paratype, WAM P25346-028, 34.5 mm SL, stained (right pelvic spine broken); B, *C. haswelli*, AMS IB.1114, 44 mm SL, New South Wales, cleared and stained.

material with transmitted light), subopercle and interopercle heavily indented but preopercle bone very lightly incised and no splintering seen on opercle of stained paratype (Fig. 3). Body completely scaled and cheeks with at least some scales (most or all scales lost but scale pockets are present). Lateral line (clearly seen only in smaller paratype) arising at upper edge of gill cover, descending steeply at posterior portion of pectoral fin, and running parallel to and near ventral profile; tenth pored scale (at bottom of descending portion near tip of pectoral fin) and following scales on lateral line with elongate posterior lobes. Base of pelvic fins slightly anterior to base of pectoral fins; inter-pelvic fin distance very small (distance between innermost rays about or less than 3% SL). Dorsal, anal, pectoral, and pelvic rays unbranched. Caudal fin with nine branched rays (11 principal rays). Stained paratype with narrow neural and haemal spines in caudal peduncle region (similar to *Limnichthys polyactis* [Nelson 1979, fig. 3A] except that last haemal spine is also narrow); two large, contiguous tear-shaped epurals with apex at distal end, expanding proximally to broadly rounded proximal end; anterior epural broader, sloping strongly anteriorly at proximal end, distal third narrow, and anterior surface concave; posterior epural with shorter narrow distal part, sides gradually diverging proximally (epural shape clear only in the stained spec-

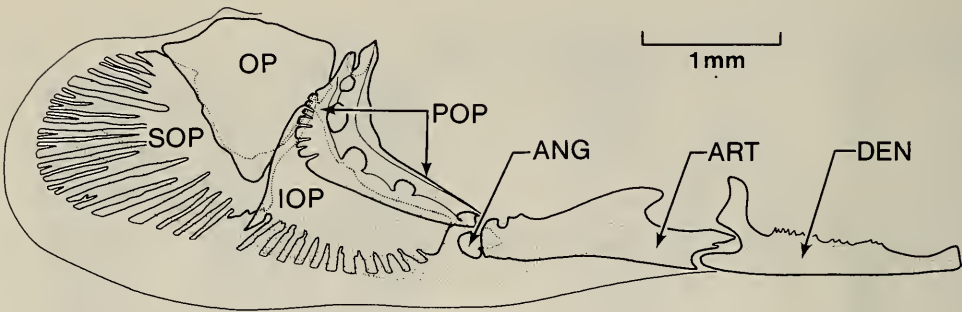


Fig. 3. *Creedia alleni*, paratype, WAM P25346-028, 34.5 mm SL, stained, right lower jaw and opercular region. Abbreviations: ANG, angular; ART, articular; DEN, dentary; IOP, interopercle; OP, opercle; POP, preopercle; SOP, subopercle. Gill cover membrane pulled down on ventral surface.

imen and its radiograph). Stained paratype with single row of well-developed teeth along upper and lower jaws, ending well before anterior tip, and patch of well-developed teeth in middle of expanded anterior tip of premaxilla (unstained specimens appear similar); weakly-developed teeth appear to be present on vomer.

No color pattern is apparent.

Etymology.—The species is named after Gerald R. Allen, Curator of Fishes at the Western Australian Museum, who brought the specimens of the new species to my attention, in recognition of his many contributions to ichthyology.

Discussion.—*Creedia alleni* is very similar to *C. haswelli*, and aside from the number of pelvic-fin rays, differs from other creediids in having the lowest number of dorsal-fin rays, and, possibly, in the shape of the epurals.

Table 1.—Morphometric and meristic data of the three type specimens of *Creedia alleni* (WAM) and nine type specimens of *Creedia partimsquamigera* (first seven AMS and last two NMV). Proportional measurements expressed as thousandths of standard length. * denotes decapitated specimen.

Standard length (mm)	<i>C. alleni</i>			<i>C. partimsquamigera</i>								
	Holo-type 40	Paratypes		Holo-type 55	Paratypes							
		35	28		67	59	57	55*	52	39	64	49
Sex	♀?	—	—	♀	♀	♀	♀	♀	♂?	♂?	♀	♂?
Body depth	72	70	78	61	63	61	60	61	—	56	56	53
Depth of caudal peduncle	34	35	41	35	32	32	30	32	33	32	31	33
Predorsal length	630	640	624	580	606	596	592	596	—	580	590	585
Prealanal length	446	459	450	460	456	462	451	438	—	448	466	462
Pectoral fin length	—	101	109	55	61	59	54	54	111	97	53	112
Pelvic fin length	48	51	58	35	39	36	34	36	75	62	33	69
Head length	206	222	223	174	172	171	170	173	163	174	175	169
Head width	62	61	60	56	59	57	55	53	—	54	58	53
Snout length	44	49	53	39	36	36	32	34	34	38	36	34
Length of orbit	31	35	32	22	21	22	20	21	—	22	18	20
Dorsal-fin rays	13	12	12	16	16	15	15	14	15	16	16	15
Anal-fin rays	24	24	24	25	28	27	26	26	26	27	25	25
Pectoral-fin rays	12	12	12	13	12	12	12	12	12	12	13	12
Pelvic-fin rays	1,3	1,3	1,3	1,4	1,4	1,4	1,4	1,4	1,4	1,4	1,4	1,4
Lateral-line scales	c. 42	c. 42	c. 40	46	46	47	44	45	—	46	45	45
Vertebrae	41	41	42	45	45	46	46	—	—	47	45	46

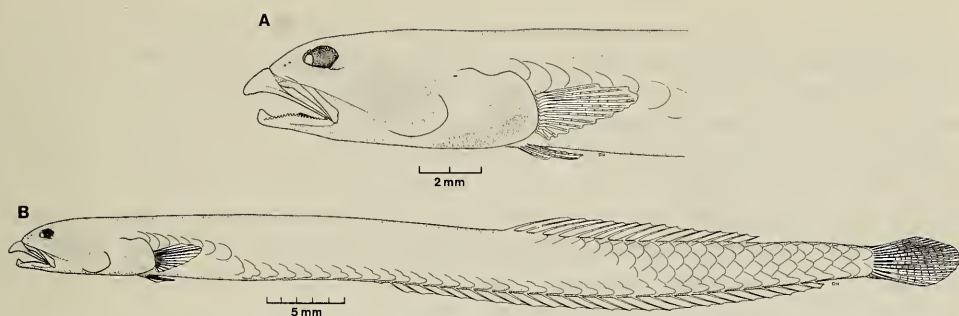


Fig. 4. *Creedia partimsquamigera*, holotype, AMS I.21420-001, 54 mm SL. A, Lateral view of head region; B, Lateral view.

Creedia partimsquamigera, new species

Fig. 4

Holotype.—AMS I.21420-001, 54.5 mm SL, ripe female, Coogee Beach, Sydney, New South Wales, 33°56'S, 151°16'E, 26 January 1980. Depth 10–15 m, in clean sand.

Paratypes.—AMS I.21420-005, 4 specimens, 52–67 mm SL (two specimens cleared and stained, including the smallest which was decapitated at capture), taken with the holotype. AMS I.22868-001, 2 specimens, 39 and 57 mm, Clovelly, Sydney, New South Wales, 33°53'S, 151°15'E, 9 September 1981. NMV-A2229, 2 specimens, 49 and 64 mm SL, Bondi Bay, Sydney, New South Wales, 33°54'S, 151°17'E, 6 August 1980. All 9 specimens were collected by R. H. Kuiter with a handnet.

Diagnosis.—A creediid with scales absent from anterior half of body except for the lateral line and a paired predorsal row, and 14–16 dorsal-fin rays. Differs further from *C. haswelli* and *C. alleni* in having a snout with a convex profile, the maxilla extending well behind the eye, the posterior tip of maxilla blunt, not forked, and the three or so elongate-most pectoral rays of males branched.

Description.—Morphometric and meristic data are given in Table 1. Snout relatively short, strongly convex in dorsal profile. Upper jaw with fleshy extension anterior to lower jaw; maxilla extending posteriorly to well behind eye; posterior tip of maxilla blunt, notch weak if present, upper portion of maxilla hidden under sheath when mouth closed. Bony dorsal projection at symphysis of lower jaw. Lower jaw bordered by one row of blunt cirri, some alternating in length, about 12–20 per side. Eyes dorsal; total interorbital width about 9–12% SL, bony width about half that; fleshy sheath covers lowermost part of eye. Tongue long and slender. Ventral opercular flap extends far forward, overlapping branchiostegal membrane; posterior portion of gill cover overlaps base of pectoral fin. Branchiostegal rays 7. Bone of gill cover splintered, subopercle and interopercle heavily indented, preopercle lightly indented, opercle lacks splintering. Scales present along lateral line, along base of dorsal fin and extending forward along midline in two adjacent rows to as far as about half distance from origin of dorsal fin to nape, and on body behind anterior portion of dorsal fin (usually about level of fifth or sixth ray); scales absent from anterior part of body except as noted. Lateral line arising at upper edge of gill cover, descending steeply near posterior

tip of pectoral fin (behind in females and before in males), and running parallel to and near ventral profile; ventral lateral-line scales with elongate posterior lobes. Base of pelvic fins slightly anterior to base of pectoral fins; inter-pelvic fin distance very small, less than base length of fin. Dorsal, anal, pectoral, and pelvic rays unbranched except three or so elongate-most pectoral rays and perhaps elongate-most pelvic ray in males branched. Caudal fin usually with 9 branched rays. Single row of well-developed teeth along upper and lower jaws, ending well before anterior tip, and patch of well-developed teeth on relatively small expansion at anterior tip of premaxilla; vomerine teeth well-developed.

Little to no color pattern is apparent in the preserved material. However, in color transparencies provided by R. H. Kuiter of the 64 mm paratype there are two stripes extending along the length of the body, one dorso-lateral and the other mid-lateral, and about 5 short, closely-set saddles just behind the nape.

Etymology.—The specific name *partimsquamigera* is Latin (masculine) for partly scaled.

Discussion.—*Creedia partimsquamigera* differs from the other species of *Creedia* in several characters (see Diagnosis). The absence of scales on much of the body is a feature similar to that found in the two nominal species of *Chalixodytes* Schultz. However, *Creedia partimsquamigera* has an abruptly descending lateral line unlike that of *Chalixodytes* (the key in Nelson 1978, is in error on this point) and is further similar to *Creedia haswelli* in the reduced number of dorsal-fin rays and having marked sexual dimorphism in pectoral- and pelvic-fin length (see later for evidence of this in *C. haswelli*).

The type material of *C. haswelli* (and of *C. clathrisquamis* Ogilby, regarded as conspecific with *C. haswelli*) is from the Sydney area as is that of *C. partimsquamigera*. Denise S. Rennis has kindly confirmed for me that the four type specimens of *C. haswelli* and the one of *C. clathrisquamis* have completely scaled bodies.

Other Australian creediids

Creedia haswelli (Ramsay).—This species is known from southeastern Australia from the Furneaux Islands off northeastern Tasmania (Scott 1969), northeastern Tasmania (Scott 1982), Victoria, New South Wales, and, on the basis of material not previously studied, from the vicinity of King Island in Bass Strait, and from western South Australia.

Marked sexual dimorphism exists in the pectoral- and pelvic-fin length as determined from the large series from Bass Strait (NMV 2219–2228, 111 specimens). Nine specimens of each sex have the following fin lengths (in % SL): females (3.5–4.9 cm SL), pectoral 90–102 and pelvic 45–54; males (3.0–4.9 cm SL), pectoral 167–201 and pelvic 97–116. In the males the longest pectoral ray is the third or fourth dorsalmost while the longest pelvic ray is the outermost soft ray. Female *C. haswelli* thus have a pectoral fin length similar to that of *Tewara cranwellae* Griffin while in males it is more similar to that of *Limnichthys fasciatus* Waite, *L. rendahli* Parrott, and *L. polyactis* Nelson. Other than in *C. partimsquamigera*, such a marked sexual dimorphism in fin length is unknown in creediids. Scott (1969) noted serrations on the posterior lobe of the lateral-line scales. This feature shows some sexual dimorphism. In the NMV material (60 specimens examined)

most females have a smooth margin to the posterior lobe while most males have a serrated border on at least the lower margin (the serrations consist of small, isolated, flaplike projections which can be curled up and easily missed although some males do seem to lack them). A few females have a weakly serrated lower margin, similar to some males. Three hardened specimens from Tasmania (QVM 1980/5/38, males as judged from the length of the paired fins) have a serrated ventral margin, similar to the NMV males. One male from South Australia (AMS I.10412, see below) has exceptionally long projections and at least one male from New South Wales (AMS I.18547-001) has moderately long projections on both the upper and lower margins. A few notches are also present on the anterior portion of the lobe in many specimens, both males and females, but occurrence of these notches was not studied in detail.

Of 30 specimens radiographed, 6 have 42 vertebrae, 14 have 43, 9 have 44, and 1 has 45.

The South Australian material (AMS E1004, one specimen *c.* 36 mm, 32°31'S, 133°18'E, south of St. Francis Island, 55 m, dorsal and anal fin rays not countable, and AMS I.10412, two specimens 37 and 38 mm, 32°35'S, 133°18'E, south of St. Francis Island, 64 m) has a pelvic fin of I,4, a dorsal fin with 14 rays, and an anal fin with 24 and 25 rays.

Most specimens of *Creedia haswelli*, as with other creediids, are known from less than 100 m depth. One 40 mm ripe female (TFDA) collected off King Island, Bass Strait, however, was from 200 m.

With the inclusion of *C. alleni* and *C. partimsquamigera*, the genus *Creedia* is diagnosed as follows: dorsal fin with 12–16 rays and anal fin with 24–28 rays; pelvic fin I,3 or I,4; isolated “patch” of well-developed teeth on anterior tip of premaxillary bone; lateral line descending abruptly near tip of pectoral fin and running adjacent to anal fin base; lateral-line scales 40–47, those behind pectoral fin with posterior extension and not trilobate; marked sexual dimorphism in length of pectoral and pelvic fins (the condition in *C. alleni* is not known).

Limnichthys fasciatus Waite.—Whitley (1945) erected the subspecies *L. fasciatus major* from one Western Australian specimen on the basis of it having only 21 dorsal-fin rays and 24 anal-fin rays. In a previous study (Nelson 1978) I counted 26 and 28 rays, respectively, in the same specimen but because it and three other specimens from Western Australia had relatively short predorsal distances I provisionally recognized the subspecies. An examination of a few characters in additional material of this species from Western Australia (AMNH 31323, three specimens 28–48 mm SL of five sent and nine in collection, Great Australian Bight, 34°56'S, 118°12'E; UCLA W55-186, seven specimens, one of which is cleared and stained, 29–41 mm SL, Nancy Cove, Rottnest Island, 32°00'S, 115°30'E, off Perth) did not reveal any marked differences in proportional measurements or meristic characters in comparison with material from eastern Australia and elsewhere although the predorsal distance is in the lower range for the species. The 10 specimens have the following characteristics: predorsal distance 445–475% SL (\bar{x} = 463); preanal distance 394–450 (\bar{x} = 426); dorsal-fin rays 24–27 (\bar{x} = 25.5); anal-fin rays 27–29 (\bar{x} = 27.9); pectoral-fin rays 11–13 (\bar{x} = 11.9); branched caudal-fin rays 8, lateral line descending gradually to end of base of anal fin; one to several rows of minute teeth on upper and lower jaws and ending well before tip and no teeth at tip of premaxilla (generally only one row for most

of toothed portion in upper jaw); vomerine teeth numerous, minute, in two patches; about 15–21 cirri along margin of lower jaw (each side) with some cirri alternating from long to short along posterior part of jaw; some long cirri in three specimens of UCLA sample with two or three filaments off a wide tip, other UCLA and all AMNH specimens with pointed cirri (I have not examined the cirri in other *L. fasciatus* in detail but specimens from Lord Howe Island, UAMZ 3765, have pointed cirri); and cleared and stained specimen with two slender epurals and lacking preopercular splintering. The color pattern is present in the AMNH material and apparent, though faintly, in one UCLA specimen. The pattern is similar to that found in *L. fasciatus* elsewhere with bars extending ventrally from the dorsal saddles and approaching and usually joining expansions along the well-developed lateral band as shown in Nelson (1978, fig. 1C). Although there is no firm basis at present for recognizing a separate subspecies in Western Australia, further study is warranted of suspected differences between Western Australian material and that from elsewhere in the number of rows of teeth in the lower jaw and in the presence or absence of branching of the cirri bordering the lower jaw.

Linnichthys donaldsoni Schultz.—Small specimens (8–19 mm SL) sent to me by D. F. Hoese from Yonge Reef, Lizard Island area, Queensland (15 specimens, AMS I.19472-122, 14°35'S, 145°36'E), Great Detached Reef, Queensland (50 specimens, AMS I.20750-004, 11°39'S, 143°59'E), and Cape Melville, Queensland (21 specimens, AMS I.20774-008, 14°10'S, 144°30'E) appear to represent *L. donaldsoni*. The few larger specimens from which accurate counts could be made have 20 or 21 dorsal-fin rays and 24 or 25 anal-fin rays (relatively low compared to previous counts made on this species). The only specimens with clear markings have nine short dorsal saddles with no lateral band (unlike the pattern in *L. fasciatus*). This is the first evidence of *L. donaldsoni* in Australia and is a considerable southern extension in its known range. *Linnichthys fasciatus* is present at Lizard Island (AMS I.19473-189) and has a color pattern characteristic for that species (i.e., at least some dorsal saddles extending down to extensions on the well-developed lateral band; about 6–9 dorsal saddles in specimens 12–27 mm SL) and higher dorsal- and anal-fin ray counts than *L. donaldsoni*.

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Note added in press.—One specimen of *Creedia alleni* (AMS I.23416-001), with I, 3 pelvics, from 34°32'S, 115°01'E, and 5 specimens of what is probably *C. howelli* (AMS I.23412-001 to I.23415-001), with I, 4 pelvics counted in the 4 undamaged ones, from 32°42'S, 131°27'E to 34°32'S, 121°16'E, were examined after this paper was in press. The two species are thus now known to be relatively close to one another.